These difficulties do not negate the benefits of California's pesticide use data base system, but they do point out the importance of ensuring accurate and complete reporting, which should be an essential element of any new state program in this area.

Predicting Which Pesticides May Cause Ground Water Contamination

Whether a pesticide will reach ground water depends upon a number of interactions between the soil, the water in the soil, and the pesticide. These interactions determine how long the pesticide survives in the soil (persistence) and how far it moves (mobility). Persistence and mobility are determined by many factors, including the following: water solubility, volatility, soil sorption, and degradation (including differing reactions to light, water, and soil microorganisms). The significance of these chemical characteristics depends upon the local soil conditions (including pH and percent organic matter), temperature, moisture, precipitation, and ground water flow patterns.

To assess the likelihood that a pesticide will reach ground water, it is important to know its chemical characteristics and the local soil conditions. For example, aldicarb is very water soluble; thus, it is not surprising to find it in ground water overlain by sandy, quickly draining soils. On the other hand, a water-insoluble material such as trifluralin, which generally absorbs very strongly to soil, would appear in ground water only after a long time if at all. Information of this type can be used to predict which locations and usage patterns are likely to result in pesticide movement into soils. Use of mobile, persistent pesticides can be prohibited in areas where analysis of the pesticide's characteristics compared with information (soil types, pH, drainage pattern, location of aquifer, depth to ground water, for example) about the location indicates that a potentially serious contamination could result from the pesticide. The use of aldicarb in some counties with sandy soils or shallow water tables has been prohibited in California and New York. Unfortunately, this action was not taken until aldicarb was detected in a number of wells.

Because of the large number of interacting factors, it is frequently difficult to decide which pesticides will contaminate ground water just by evaluating individual quantitative measures of chemical and soil characteristics. For example, low soil mobility can be offset by persistence. The interval between the application of a pesticide and the occurrence of the next rainfall (or irrigation) also may have a major impact on the pesticide contamination reaching ground water. A rainfall soon after an application will leach a pesticide before it has a chance to degrade. Also, the variation in soil condi-